

# **Work Stress in Two Health Systems: An International Survey**

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## Declaration

By submitting this research project electronically, I declare that the entirety of the work contained therein is my own original work, that I am the authorship owner thereof (unless to the extent explicitly stated otherwise) and that I have not previously in its entirety or in part submitted it for obtaining any qualification.

Signature:

.....

Dr. Sebastian Hein Scott-Waring de Haan

Date: December 2017

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## ABSTRACT

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### Introduction

High levels of occupational stress can cause health and performance issues within the specialty of emergency medicine (EM). These issues can lead to increased burnout and attrition from the profession. We examined workplace stress experiences for both trainees and certified EM specialists in settings where the specialty of EM is new (South Africa) and better established (Canada).

### Methods

An online cross-sectional survey of EM trainees and physicians in both countries was conducted using the validated Management Standards Indicator Tool (MSIT, Health and Safety Executive, UK). A 35-item questionnaire where each item was weighted on a five-point Lickert scale was sent that assesses six key domains of work related stress with lower scores indicative of higher stressors. Comparisons were made using means and 95% confidence intervals.

### Results

There were 89 South African, and 515 Canadian respondents. In Canada, specialists (n=396) had significantly higher Demands (2.6 (95%CI 2.6-2.7) vs. 3.0 (2.8-3.1)) and Manager Support stressors (3.3 (3.3-3.4) vs. 3.9 (3.6-4.0)) than trainees (n=36). Canadian trainees reported higher Role stressors (4.0 (3.9-4.1) vs. 4.2 (4.2-4.3)). In South Africa, trainees (n=39) had higher stressors than specialists (n=36) on Demands (2.2 (2.1-2.3) vs. 2.7 (2.5-2.8)), Control (2.6 (2.4-2.7) vs. 3.5 (3.3-3.7)), Role (3.6 (3.4-3.7) vs. 4.0 (3.7-4.3)) and Change (2.4 (2.2-2.6) vs. 3.0 (2.7-3.3)). South African trainees had significantly higher stressors on all domains than Canadian trainees. While South African specialists had lower Control stressors than Canadian counterparts, they had higher Peer Support and Relationship stressors.

### Conclusions

Risk factors for work-related stress are higher in all domains among South African EM trainees compared with Canadian trainees, and differ from South African EM specialists. Canadian EM trainees reported a lack of role clarity. Canadian specialists had lower work control, but better peer support and work relationships than SA specialists. We hope to further our research by identifying targeted interventions to help reduce or manage these disparities.

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## ABBREVIATIONS AND TERMS

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ABEM	American Board of Emergency Medicine
CJEM	Canadian Journal of Emergency Medicine
EM	Emergency Medicine
HPCSA	Health Professions Council of South Africa
HSE	Health and Safety Executive
Mmed	Master of medicine
PPE	positive practice environment
UK	United Kingdom
WADEM	World Association for Disaster and Emergency Medicine
WHO	World Health Organisation



## CHAPTER 1: RESEARCH ASSIGNMENT PROTOCOL

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### 1.1 PROTOCOL ABSTRACT

#### Background

Occupational stress is prevalent in the health care sector with the highest rates noted in the frontline of care such as emergency medicine. The Health and Safety Executive (HSE) of the United Kingdom (UK) has identified 6 main contributing factors for work related stress. They are ‘demands’, ‘control’, ‘support’, ‘relationships’, ‘role’ and ‘organisational change’. The aim of this study is to identify and assess work stressors amongst emergency physicians in order that these work stressors may be mitigated in order to reduce the high levels of work stress endured by emergency physicians.

#### Aim

To identify and assess work stressors of South African emergency medicine (EM) trainees and specialists and of their respective counterparts in Canada.

#### Objectives

- To identify and assess South African and Canadian trainee EM physicians’ work stressors
- To identify and assess South African and Canadian EM physicians’ work stressors

#### Methods

A cross-sectional survey using the validated HSE Management Standards Indicator Tool based on a 5 point Likert scale to measure work stressors. The study will survey EM trainees and EM physicians from South Africa and their counterparts in Canada

## 1.2 INTRODUCTION

Occupational stress is a serious problem. In the United Kingdom (UK) it was noted that in 2011/2012 work related stress accounted for 40% of all work related illnesses.<sup>(1)</sup> Work stress can lead to a number of negative outcomes from poor mental and physical health to decreased career longevity and burnout.<sup>(2–5)</sup> A recent study by Nielsen et al.,<sup>(2012)</sup> shows a significant link between increased work stress and adverse outcomes.<sup>(6)</sup> The American Board of Emergency Medicine (ABEM) conducted a longitudinal study that followed a cohort of Emergency Physicians from 1994-2005. This study reported that 31% of responders indicated that burnout was (and still is) a significant problem in emergency medicine.<sup>(7)</sup>

The World Health Organization (WHO), defines occupational stress as ‘the response people may have when presented with work demands and pressures that are not matched to their knowledge and abilities and which challenge their ability to cope.’<sup>(8)</sup> Both the WHO and the Health and Safety Executive (HSE) of the United Kingdom acknowledge that we all experience pressure at work on a daily basis and need it to motivate us and perform at our best; however, when we experience too much pressure without the opportunity to recover we experience stress.<sup>(9,10)</sup>

A study by Burbeck et al.,<sup>(2002)</sup> identified that Emergency Medicine consultants working in the UK have a significant level of psychiatric illness with 44% of respondents having some form of mental ill health.<sup>(11)</sup> A recent study of emergency medicine residents in the United States of America (USA) noted that residents did report overall dissatisfaction with their lifestyles and that a significant number of residents turned to alcohol to help cope with the stresses of residency.<sup>(12)</sup> A study by Koenig and Keller noted that more than 50% of their physician sample reported medium to high levels of emotional exhaustion.<sup>(13)</sup> This emotional exhaustion is a key indicator for the identification of burnout.<sup>(14)</sup> Koenig and Keller also noted that a large percentage of the physicians (78%) experienced strong feelings of depersonalisation, which is also a key indicator for burnout.<sup>(13,14)</sup> A study of Canadian Emergency Physicians noted that there is a parallel link between the increase in clinical working hours and a decrease in job satisfaction.<sup>(15)</sup>

One of the stressors of emergency unit work is the demanding hours and the fact that most units require 24/7 staff cover arranged in various shift patterns.<sup>(15)</sup> This shift work (which results in sleep deprivation) has significant deleterious effects such as impairment in cognition, motor skills and mood.<sup>(16)</sup> Why is this important? A landmark study by the Institute of Medicine in the USA in 1999 ‘To Err is human’ and a follow-up study in 2009 ‘To Err is Human - To Delay is Deadly’ noted that in the year 1999, 98,000 people needlessly died that year because of preventable medical harm and a follow-up study ten years later noted that more than 100,000 people are still dying each year from preventable medical harm.<sup>(17,18)</sup> This equates to three fully loaded jumbo jets crashing every other

day.(18) If work hours can be improved resulting in better wake-sleep patterns and less sleep deprivation then an improvement of this stressor will help overall patient outcomes.

By mitigating key work stressors in the work environment of the emergency physician it will hopefully lead to a reduction in work stress. As noted previously, persistent high levels of work stresses leads to burnout.(13) This in turn may lead to attrition from the profession.(3,7,12) Why is this so important? The specialty of Emergency Medicine is relatively new in South Africa being only recognised in South Africa by the South African Health Professions Council since 2003. As such, there are only a few EM specialists in the country. These specialists are a scarce resource. In order to bolster the number of specialists, to meet South Africa's needs, it is imperative that a work environment trying to minimise work stressors for both registrars and specialists be optimised. It is anticipated that by mitigating key work stressors in the emergency physician's work environment that this will hopefully lead to a reduction in work stress.

The motivation of the study is to identify work related stressors in two differently resourced health systems in order to lead to a reduction in work stress. The reduction of perceived stress for doctors will not only be of benefit to the individuals but is likely to be of benefit for patient care and safety. The finding of similar work stressors would mean the results are more widely generalized whereas differences would suggest that these may be due to local effects such as resources. By utilising the UK HSE Management Standards Indicator tool potential corrective actions will be easier to identify. We expect the study to raise hypotheses for follow up studies, which may focus on a more in depth analysis on the stressors that were identified in this study.

Previous work has focussed on clinical indicators of anxiety or depression most often in emergency department nursing staff.(20–22) We have not found studies trying to identify key work stressors in the emergency centre of two differing health systems and none that have used the validated UK HSE Management Standards Indicator tool.

### **1.2.1 Research Question**

What are the key work stressors of emergency medicine trainees and physicians in South Africa and of their respective counterparts in Canada?

### **1.2.2 Aim**

To identify and assess work stressors of emergency medicine trainees and physicians in South Africa and of their respective counterparts in Canada.

### **1.2.3 Objectives**

- To identify and assess South African and Canadian trainee EM physicians' work stressors
- To identify and assess South African and Canadian EM physicians' work stressors

## 1.3 METHODOLOGY

### 1.3.1 Study design

A cross sectional study will be conducted. The validated HSE Management Standards Indicator Tool will be used (23). This tool is a 35 item questionnaire with the responses based on a likert scale so that they can be easily quantifiable and subjected to statistical analysis. The questionnaire will be distributed via survey monkey and answered anonymously.

### 1.3.2 Population

1. South African Emergency Medicine (EM) trainees registered with an EM program at the Universities of Cape Town and University of Stellenbosch, the University of Witswaterstrand (Johannesburg), University of Kwa-Zulu Natal (Durban), University of Pretoria (Pretoria) and the University of Limpopo (Limpopo).
2. Canadian EM trainees registered with the Canadian Association of Emergency Physicians (CAEP).
3. South African EM physicians registered with the HPCSA (Health Professions Council of South Africa).
4. Canadian EM physicians registered with the Canadian Association of Emergency Physicians (CAEP).

### 1.3.3 Sampling

Convenience sampling will be employed. The respondents from the population surveyed will determine the sample sets. Emails will be attained via database interrogation. The population identified (as above) will be invited via email notification to complete the HSE indicator tool questionnaire anonymously on survey monkey. In order to improve response rates to the survey, the questionnaire will be resent after one, three and six week intervals.

### 1.3.4 Recruitment of study population:

#### 1.3.4.1 Inclusion criteria:

The study will include registrars and residents specialising in Emergency Medicine via database interrogation. It will also include doctors who have attained the specialist emergency medicine fellowship.

#### 1.3.4.2 Exclusion criteria:

The study will exclude doctors not specializing in emergency medicine and specialist not working in South Africa or Canada respectively. The study will also exclude consultants or specialists not registered with the College of Emergency Medicine of South Africa or the Canadian Association of Emergency Physicians in Canada.

### 1.3.5 Data Collection

The Health and Safety Executive of the UK identifies six key areas of work design that if not managed properly are associated with poor health and wellbeing, lower productivity and increased sickness absence.(19) The six main risk factors for work related stress are: ‘Demands, control, support, relationships, role and organisational change’.(19) The brief details pertaining to each of these risk factors are the following:

- Demands (which includes issues such as workload, work patterns, and the working environment);
- Control (how much say the person has in the way they do their work);
- Support (which includes the encouragement and resources provided by the organisation, line management and colleagues);
- Relationships at work (which includes promoting positive working practices to avoid conflict and dealing with unacceptable behaviour)
- Role (whether people understand their role within the organisation and whether the organisation ensures that the person does not have conflicting roles);
- Change (how organisational change is managed and communicated)

(19)

Data for the study will be collected via the distribution of the HSE indicator tool questionnaire on survey monkey. This indicator tool is a 35-item questionnaire where each item is weighted on a five-point Lickert scale and assesses the six key domains of work related stress (indicated above) with lower scores indicative of higher stressors. Results will be captured onto Microsoft Excel 2010, where it will be backed up on external USB storage devices. The results of the questionnaires will be returned to the principal investigator where they will be collated into tables to enable the data to be interrogated statistically. The data will only be accessible by the principal investigator and supervisors of the study as well as the bio-statistician. Data will also be encrypted and password protected to ensure confidentiality. This is a low risk study and no identifiers will be used. If the respondent answers then it is inferred that they provided informed consent to participate in the study. If they decide to withdraw at any stage, their results will be omitted from the study.

### 1.3.6 Timeline

Table 1: Proposed Timeline

<b>2014</b>	<u>Jan</u>	<ul style="list-style-type: none"> <li>Formulation of research proposal</li> </ul>
	<u>Feb</u>	<ul style="list-style-type: none"> <li>Formulation of research proposal</li> <li>Submission to Divisional Research Committee</li> </ul>
	<u>July</u>	<ul style="list-style-type: none"> <li>Submission to Stellenbosch Human Research Ethics Committee</li> <li>Approval Data collection and capturing</li> </ul>
	<u>Aug</u>	<ul style="list-style-type: none"> <li>Data collection and capturing</li> </ul>
	<u>Sept</u>	<ul style="list-style-type: none"> <li>Data collection and capturing</li> </ul>
	<u>Oct</u>	<ul style="list-style-type: none"> <li>Data analysis</li> </ul>
	<u>Oct</u>	<ul style="list-style-type: none"> <li>Data analysis</li> </ul>
	<u>Nov</u>	<ul style="list-style-type: none"> <li>Thesis write-up &amp; submission – Study Supervisor</li> </ul>
	<u>Dec</u>	<ul style="list-style-type: none"> <li>Feedback – Study Supervisor – Apply corrections</li> <li>Final submission for grading</li> </ul>
<b>2015</b>	<u>Jan</u>	<ul style="list-style-type: none"> <li>Feedback</li> </ul>
	<u>Feb</u>	<ul style="list-style-type: none"> <li>Feedback</li> </ul>
	<u>Mar</u>	<ul style="list-style-type: none"> <li>Feedback</li> </ul>

### 1.3.7 Statistical and Data Analysis

The statistical analysis will identify the key stressors of the two groups and their subgroups obtained from the two different health care systems. Data will be collected and collated in a Microsoft Excel<sup>®</sup> spreadsheet using pivot tables. Measured variables will be described by using summary statistics. Distributions of variables will be presented with histograms and frequency tables.

### **1.3.8 Ethical and Legal Considerations**

Participant autonomy and confidentiality will be maintained throughout all phases of the study. Consent will be obtained via acceptance of participation on survey monkey through a waiver. The questionnaire will be answered anonymously. Data will be protected through encryption and will only be visible to the principal investigators, supervisors and biostatistician. The study will benefit the participants as well as emergency medicine specialists/consultants and registrars/residents not surveyed by helping to identify key work stressors. Through the identification of key work stressors these can be assessed, modified or mitigated. This will hopefully lead to improved health outcomes for patient care as well as decreased work stress for the physician. This decreased work stress is anticipated to lead to improved physician satisfaction and career longevity. By instilling monitors in the work environment (to assess the modifications or eliminations of the individual stressor), relevant stakeholders can carry out audits to assess how these changes have reduced work stress. No adverse events or potential harm is expected to the study's participants. The ethical risk associated with the study is minimal. There should be no physical risk and arguably minimal psychological, social, economic and legal risks. One of the indirect benefits for the participant engaging in the survey is that the participant may be able to identify and assess their own significant work stressors and address them. Participants are free to follow-up with their supervisor or occupational health department if there are any concerns during or after the survey. By gathering the data from this research it is intended that all stakeholders involved in providing emergency care in the Emergency Centre will be able to use this information to improve and optimise the delivery of care as well as minimise and mitigate work stressors contributing to high levels of stress in the emergency centre.

### **1.3.9 Limitations**

The study is only investigating emergency medicine registrars, residents and consultants registered in South Africa and Canada respectively (e.g. selection bias and sampling bias). Volunteer bias may be introduced if only a portion of the sample selection participate in the study, however, repeating the survey may negate this bias. This sample size may not adequately give a true representation of the work stressors endured in the Emergency Centre setting (underpowered). The response rate in a typical survey is approximately 30%,<sup>(24)</sup> however, as per volunteer bias, repeating the survey may improve response rates. Furthermore, the lack of consistency between emergency units may introduce confounding variables. To help with improving the response rate, distribution and management of the survey in Canada we will use an Emergency Medicine resident in St. John's, New Brunswick, Canada. Information and questionnaire biases are also a consideration but with the use of the HSE Indicator Tool we hope to minimise the effect of these variables. In South Africa, particularly, there are many doctors who work in the emergency centre but are not registered with the college of emergency medicine of South Africa and hence will not be included in the study. Furthermore, age and experience are other variables that may influence the outcome of the results.

### 1.3.10 Budget

The primary investigator will fund all study expenses.

Table 2: Budget Projection

<b>Budget</b>				
<b>Item</b>	<b>Description</b>	<b>Unit cost</b>	<b>No. of Units</b>	<b>Total cost</b>
1.	Internet and Email services (Pay as you go airtime: @R250/month x 3 months Internet 3G: @R160/month 1Gig/ month x 3Months	R410.00/ month	3	R1230.00
2. Specialized services	Bio statistical Services	R185.00/ hr	10	R1850.00
3. Office supplies, computer software (Adobe to Word) printing & reproduction for data collection	Printing, Paper			R2000.00
4. On line Resources Survey Monkey				R2500.00
<b>Total Direct Costs</b>				<b>R7580.00</b>
<b>Indirect Costs (12%)</b>				<b>R702.60</b>
<b>Total</b>				<b>R8282.60</b>

## 1.4 REPORTING AND IMPLEMENTATION OF RESULTS

The abstract will be presented at the Stellenbosch University academic year day later in the year (Aug 2014) and will also be presented next year at World Association for Disaster and Emergency Medicine (WADEM) conference in Cape Town 2015. The study will be written up for my thesis for Mmed (EM) and to submit it for publication in a scientific journal. Feedback to relevant stakeholders



such as hospital and departmental managers of the two health care systems regarding key identifiable work stressors will be provided so that potential reduction and/or mitigation of these work stressors can be implemented. Further, markers for clinical governance and performance should be instituted in order that further audits can be made.

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## CHAPTER 2: COMPREHENSIVE LITERATURE REVIEW

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A literature search was conducted of the databases OVID SP (which includes MEDLINE and PsychINFO), PsychARTICLES, Web of Science, SCOPUS, Africa-Wide, Google and Google Scholar. Boolean search terms used were: emergency AND burnout OR work stress\* OR occupational stress\* OR job stress\* AND physician\* OR doctor\* OR specialist\* OR consultant\* OR registrar\* OR resident\* OR trainee\*. A designated search limit was placed searching databases from January 1985 to end October 2015. Many articles that were retrieved discussed burnout as their primary point of discussion with very few articles assessing and/or discussing occupational stress, job stress or work stress.(1,2)

### 2.1 OCCUPATIONAL STRESS

Occupational stress is a serious problem worldwide. The 2012 Global Workforce Study by Towers Watson reported that four out of 10 respondents were directly influenced by excessive pressure (stress) on the job.(3) In Canada (high income country), work stress has an estimated financial cost of at least \$20 billion Canadian dollars per year with over one in four Canadian workers describing their lives as highly stressful.(4,5) In the United Kingdom (UK) in 2014/2015 work related stress accounted for 35% of all work related illnesses.(6) Unfortunately such statistics are not readily available in South Africa. The World Health Organization (WHO), however, noted that in South Africa in 2004 work stressors such as workplace violence were alarming with 50% all health care workers in government hospitals reporting verbal abuse.(7)

The WHO defines occupational stress as ‘the response people may have when presented with work demands and pressures that are not matched to their knowledge and abilities and which challenge their ability to cope.(8) Both the WHO and the Health and Safety Executive (HSE) of the UK acknowledge that we all experience pressure at work on a daily basis and need it to perform at our best; however, when we experience too much pressure without the opportunity to recover we experience stress.(9,10)

### 2.2 OCCUPATIONAL STRESS SEQUELAE

Work related stress affects us in different ways at different times and is often a result of a combination of factors conspiring together within our personal and working lives.(10) A report by Work Cover, New South Wales, Australia highlights from the literature that work stress can result in a number of problems and can be divided into psychological, physiological and behavioral sections.(11)

The psychological consequences of work stress can be emotional exhaustion, anxiety, depression, mood disturbance, lowered morale, job dissatisfaction, depersonalization (feeling personally detached from the job), decreased personal accomplishment, reduced quality of working life and reduced life satisfaction.(11) Burbeck (2002) identified that Emergency Medicine consultants working in the UK have a significant level of psychiatric illness with 44% of respondents having some form of ill mental

health.(12) A recent study of emergency medicine residents in the USA, noted that residents did report overall dissatisfaction with their lifestyle and that a significant number of residents turned to alcohol to help cope with the stresses of residency.(13) Keller (1989) indicated that more than 50% of their physician sample reported medium to high levels of emotional exhaustion.(14) This emotional exhaustion is a key marker for the identification of burnout.(15) Data also revealed that a large percentage of the physicians (78%) experienced strong feelings of depersonalization, which is also a key marker for burnout.(14,15) A survey of Canadian Emergency Physicians highlight that by increasing clinical working hours worked there is an associated decrease in job satisfaction.(16) Depressed residents have also been shown to make 6.2 times more medication errors than non-depressed residents.(17)

Physical sequelae of work stress may be general fatigue, low back pain, protracted neuroendocrine reaction (cortisol stress response), and cardiovascular disease (e.g. Hypertension).(11) In Canada, Parshuram (2004) identified that of the residents working on average 69 hours per week, 21% developed ketonuria and 10% demonstrated an arrhythmia or heart rate abnormality.(18)

An example of behavioral responses to work stress may be absenteeism or presenteeism (defined as the practice of coming to work despite illness, injury, anxiety etc., often resulting in reduced productivity).(19) Alarming, in an environment where physicians are expected to be taking care of the ill, they themselves often present to work with 'sickness presenteeism' reportedly being as high as 80-90%.(20,21)

The more severe end of the work stress spectrum may present as burnout and attrition from the profession.(2,22–25) The ABEM (American Board of Emergency Medicine) performed a longitudinal study following a cohort of Emergency Physicians from 1994 to 2005 and reported that 31% of responders indicated that burnout was a significant problem in emergency medicine.(26) Alarming, more recent surveys showed that emergency medicine had some of the highest (if not the highest) prevalence of burnout amongst any specialty.(25,27–29). The three main indicators of burnout are emotional exhaustion, depersonalization and a reduced sense of personal accomplishment and is often characterized by a slow erosion within these three areas.(15,30)

The specialty of emergency medicine (EM) is regarded inherently as one of the most stressful in medicine.(14,23,29,31–33) Shanafelt (2012) acknowledges that burnout is more prevalent amongst physicians than the general population with a higher degree of dissatisfaction of work-life balance as compared to the general population.(25)

### **2.3 EMERGENCY MEDICINE IN TWO HEALTH SYSTEMS**

Emergency medicine is a young specialty with a paucity of qualified specialists. Low to middle income countries, such as South Africa, are severely affected by this skills shortage. In 2014, South

Africa only had 92 emergency medicine specialists registered with the HPCSA (Health Professions Council of South Africa) for a population of 54 million people.(34) Rossouw (2011) analysed doctors working in community hospitals in Cape Town, South Africa, and noted the prevalence of burnout and depression to be as high as 76% and 27% respectively.(35)

In Canada, emergency medicine has been officially recognized as a specialty since 1982. In 2014, Canada had over 3000 EM physicians and EM physicians in training for a population of 35.35 million people.(36) According to the Romanow Commission in 1999, it was estimated that one EM physician was needed for 5000 patient emergency department (ED) visits per annum.(37) This estimation translated to 1000 EM physicians required for the province of Ontario alone.(37) However, the total number of ED visits easily outstrips the number of practicing EM physicians. Hence, the shortfalls of practicing ED physicians are prevalent for both Canada and South Africa with the latter having a worse ratio.

## **2.4 THE PROBLEM**

Lepnurm (2009) conducted a study across Canada in 2004 surveying physicians' daily distress and noted that EM physicians were the most distressed compared to other major specialties.(32) A qualitative review of the literature by Bragard (2014) on the quality of work life, burnout and stress in emergency department physicians, affirmed that emergency physicians showed moderate to high levels of burnout but interestingly still had high levels of job satisfaction.(1) The factors contributing to this high level of burnout were increased demands (longer hours and more night shifts) plus poor job resources, lack of control, poor manager and colleague support as well as a lack of continuing education.(1) High levels of job satisfaction were associated with working in an academic centre, less administrative duties and working in a friendly job culture where colleagues feel like extended family.(1)

Pam Harrison (1993) acknowledges that not knowing what is coming into the ER is part of the inherent thrill, but there is no denying that the nature of emergency medicine, which sees doctors chronically exposed to acute illnesses, pain, trauma and death, brings with it additional demands that physicians in most other specialties don't have to deal with.(38) Furthermore, the pattern is persistent for 24 hours a day and 365 days a year. Frank (2002) highlights the deleterious effects of shift work but admits it (shiftwork) is a necessary evil in order to provide constant patient care on a 24/7 basis.(39)

Indeed, one of the significant stressors of emergency unit work is the demanding hours and the fact that most units require 24/7 staff cover arranged via various shift patterns.(40) This shift work routine has significant deleterious effects from impairment in cognition, motor skills and mood.(41) Nielsen (2013) showed an association between a range of work stressors and adverse events in the emergency department.(42) A study by Fordyce (2003) identified 18 errors in emergency care for every 100

patients treated in a busy emergency department with a 2 percent adverse event rate.(43) This extrapolated to more than 18 million errors in US emergency departments per year.(43) A landmark study by the Institute of Medicine in the USA in 1999 ‘To Err is human’ and a follow-up study in 2009 ‘To Err is Human - To Delay is Deadly’ noted that in the year 1999 98,000 people needlessly died directly due to preventable medical harm. A follow-up study ten years later noted that more than 100,000 people still died every year from preventable medical harm.(44) This equates to three fully loaded jumbo jets crashing every other day.(44) An overall reduction in work stressors should therefore alleviate work stress in Emergency Medicine physicians, resulting in a more positive practice environment with an improvement in patient outcomes.

## **2.5 WORK STRESSORS IN TWO HEALTH SYSTEMS**

Both the Canadian and South African health-care systems are traditionally based on the commonwealth system for health care delivery. Together they offer a good comparative model to assess the impact of work related stressors. Similarities between the two countries stressors may be explained by the way EM systems are organized in each country. Disparities may be due to the inherent stressors within the organization of EM itself.

In order to bolster the number of specialists so desperately required, it is imperative that a work environment trying to minimize work stressors be optimized; thereby reducing the risk for any negative mental or physical affects negatively impacting on attrition from an already under resourced profession. Direct management of the risk factors associated with work stress within the emergency physician work environment should lead to an overall reduction in work related stress. The aim of this study was to identify and assess work stressors amongst emergency medicine trainees and specialists in the Canadian and South African health care systems that could possibly contribute to future burnout.

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### **CHAPTER 3. ARTICLE FOR CJEM: WORK STRESSORS AFFECTING EMERGENCY PHYSICIANS AND TRAINEE EMERGENCY PHYSICIANS: AN INTERNATIONAL SURVEY**

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### **3.1 ABSTRACT**

#### **Introduction**

High levels of occupational stress can cause health and performance issues within the specialty of emergency medicine (EM). These issues can lead to increased burnout and attrition from the profession. We examined workplace stressors that contribute to occupational stress for both EM trainees and certified EM specialists in new (South Africa) and better established (Canada) settings.

#### **Methods**

An online cross-sectional survey of EM trainees and EM physicians in both countries was conducted using the validated Management Standards Indicator Tool (MSIT, Health and Safety Executive, UK). This is a questionnaire that assesses six key domains of work related stress. Comparisons were made using means and 95% confidence intervals.

#### **Results**

There were 89 South African, and 515 Canadian respondents. In Canada, specialists (n=396) had significantly higher Demands (2.6 (95%CI 2.6-2.7) vs. 3.0 (2.8-3.1)) and Manager Support stressors (3.3 (3.3-3.4) vs. 3.9 (3.6-4.0)) than trainees (n=36). South African trainees had significantly higher stressors on all domains than Canadian trainees. While South African specialists had lower Control stressors than Canadian counterparts, they had higher Peer support and Relationship stressors.

#### **Conclusions**

Risk factors for work-related stress are higher in all domains among South African EM trainees compared with Canadian trainees, and differ from South African EM specialists. Canadian EM trainees reported a lack of role clarity. Canadian specialists had lower work control, but better peer support and work relationships than SA specialists. We hope to

further our research by identifying targeted interventions to help reduce or manage these disparities.

### 3.2 INTRODUCTION

Occupational stress is a serious problem worldwide. The 2012 Global Workforce Study by Towers Watson reported that four out of 10 respondents were directly influenced by excessive pressure (stress) on the job.(1) In Canada, work stress has an estimated financial cost of at least \$20 billion Canadian dollars per year with over one in four Canadian workers describing their lives as highly stressful.(2,3) In the United Kingdom (UK) in 2014/2015 work related stress accounted for 35% of all work related illnesses. (4) Unfortunately such statistics are not readily available in South Africa. The World Health Organization (WHO), however, noted that in South Africa in 2004 work stressors such as workplace violence were alarming with 50% all health care workers in government hospitals reporting verbal abuse.(5) The WHO defines occupational stress as ‘the response people may have when presented with work demands and pressures that are not matched to their knowledge and abilities and which challenge their ability to cope.(6) Both the WHO and the Health and Safety Executive (HSE) of the UK acknowledged that we all experience pressure at work on a daily basis and need to perform continuously at our best; however, when we experience too much pressure without the opportunity to recover we experience stress.(7,8)

The specialty of emergency medicine (EM) is regarded inherently as one of the most stressful in medicine.(9–14) This high level of occupational stress can lead to a number of negative outcomes from poor mental and physical health to decreased career longevity and burnout.(6,9,13,15–18) Shanafelt (2012) acknowledged that burnout is more prevalent amongst physicians than the general population with a higher degree of dissatisfaction of work-life balance as compared to the general population.(19) Recent surveys of doctors

serving in the frontline of medicine, such as emergency medicine, concluded to have some of the highest (if not the highest) prevalence of burnout amongst any specialty.(18–20)

Emergency medicine is a young specialty with a paucity of qualified specialists. Low to middle income countries, such as South Africa, are severely affected by this acute shortage.

In 2014, South Africa only had 92 emergency medicine specialists registered with the HPCSA (Health Professions Council of South Africa) for a population of 54 million people.(21) Rossouw (2011) analysed doctors working in community hospitals in Cape Town, South Africa, and noted that the prevalence of burnout and depression were as high as 76% and 27% respectively.(22)

In Canada, emergency medicine has been officially recognised as a specialty since 1982. In 2014, Canada had over 3000 EM physicians and EM physicians in training to serve a population of 35.35 million.(23) According to the Romanow Commission in 1999, it was estimated that one EM physician was needed for 5000 patient emergency department (ED) visits per annum.(24) This estimation translated to 1000 EM physicians required for the province of Ontario alone.(24) However, the total number of ED visits easily outstrips the number of practicing EM physicians. Hence, the shortfall of practicing ED physicians are prevalent for both Canada and South Africa with the later having a worse ratio.

Both the Canadian and South African health-care systems are traditionally based on the commonwealth system for health care delivery. Together they offer a good comparative model to assess the impact of work related stressors. Disparities between the two countries stressors may be explained by the way EM systems are organized in each country.

Similarities may be due to the inherent stressors within the organization of EM itself.

In order to bolster the number of specialists needed, it is imperative that a work environment trying to minimize work stressors be optimized; thereby reducing the risk for any negative

mental or physical affects to reduce attrition from the already under resourced profession.

The aim of this study was to identify and assess work stressors amongst emergency medicine trainees and specialists in the Canadian and South African health care systems that could possibly contribute to future burnout.

### **3.3 METHODOLOGY**

#### **3.3.1 Study Design**

A cross sectional study was conducted of EM doctors in Canada and South Africa. The study was approved by the Health Research Ethics Committee at Stellenbosch University, Stellenbosch, South Africa (ref: S14/07/146) and the Research Ethics Board of the Horizon Health Network, Saint John, New Brunswick, Canada (ref: 2014-2033).

#### **3.3.2 Study Population and Setting**

The population of the study was identified as follows. For the Canadian contingent, only emergency medicine doctors registered with the CAEP (Canadian Association of Emergency Physicians) were identified and included in the survey. For South African, EM doctors registered with the HPCSA (Health Professions Council of South Africa) and those who are registered with formal academic EM specialty training programs (as EM specialists and EM specialist trainees). These programmes were based at: University of Cape Town, University of Stellenbosch, the University of Witswaterstrand (Johannesburg), the University of Pretoria (Pretoria), the University of Kwa-Zulu Natal (Durban) and the University of Limpopo (Limpopo). The study excluded EM specialists or trainee EM specialists not practicing within South Africa or Canada respectively.

#### **3.3.3 Sampling**

Between October to December 2014, emails were sent inviting all EM trainees and specialist EM doctors in Canada and in South Africa to participate anonymously in this survey. The



associated link to the survey was presented in the online platform embedded in the invitational email. To improve response rates to the survey, reminder emails were sent at regular intervals.

### **3.3.4 Survey Tool**

The validated management standards indicator tool (MSIT) was developed by the United Kingdom Health and Safety Executive (HSE) and has been concluded that the HSE MSIT is a psychometrically sound measure of organizational performance against the HSE management standards and can provide a broad overview of work-related stress within organizations. (25–28) Many other survey tools assess burnout but do not directly attempt to assess work stress.(16)

The HSE of the UK advocate a risk assessment approach and identified six key areas of work design that if not managed properly are associated with poor health and wellbeing, lower productivity and increased sickness absence. (29,30) The primary six factors that the HSE identify for work related stress are demands, control, support, relationships at work, role and change.(27)

The MSIT is a 35-item questionnaire (Appendix 1) rating the respondents' perceptions of the six key factors for work related stress based on a Likert scale. The answer to each question is weighted from one (poor) to five (desirable) and quantified by summarizing how well the organization is performing in managing each of the six work related stressors in relation to what their management standards are.(28,29) The score is inversely proportional to your stress risk. A high score is indicative of less stress risk and a low score is an indicator of increased risk for stress, which in turn may lead to mental or physical ill health. The MSIT is divided in such a way that different questions pertain to different stressors (Table 1).

Also included in the survey were demographic identifiers in order to assess work stressors by varying categories (Table 2).

### **3.3.5 Analysis:**

Respondents answered the questionnaire and demographic questions anonymously and results were then exported into Microsoft Excel 2010 spreadsheet. The data was then interrogated using IBM® (International Business Machines) SPSS® (Statistical Package for the Social Science) software. The means and corresponding 95% confidence intervals were calculated for each of the demographic subsets' work stressors categories. Box plots and radar graphs were used to graphically demonstrate the key results.

## **3.4 RESULTS**

The Canadian survey yielded 515/1297 responses (39.8% response rate) while 89/148 responses were received from the South African (60% response rate) survey. From the South African cohort 14 surveys were omitted. Ten responses were incomplete, two did not indicate if they were EM physicians or EM trainees and two did not adhere to the inclusion criteria by not qualifying as either EM physician or EM trainee. From the Canadian cohort five responses were incomplete (and therefore omitted from the survey) and seventy-eight responses were discarded from the survey as they were not registered EM trainees or EM specialists. Finally seventy-five South African and 432 Canadian survey responses were included in the final analyses respectively (Figure 1).

Three respondents included in the sample (one South African and two Canadians) did not complete the demographic section of the survey but were included in the MSIT survey analysis (Table 2).

The majority of respondents were male except for the Canadian trainees where the male:female (3:4) ratio was inverse to the other survey respondent categories. Most of the

trainees fell within the 25-34 inclusive age category. The number of Canadian specialists declined sequentially across the advancing age categories. Most of the trainees practiced EM for less than five years. The majority of specialists in South Africa (47.2%) practiced for less than a decade as opposed to 39.7% of Canadian specialists (157) practiced for 2-3 decades. Of the 38 South African trainees included in the demographic analysis, seven (18.4%) indicated they would not be working in EM in the next five years with 13.2 % not envisioning EM as a long term career whereas none of the Canadian trainees felt this way. More than eight percent of South African specialists did not see EM as a viable long-term career whereas more than 6% of Canadian specialists felt the same way.

With respect to the stressors assessed South African EM trainees (n=39) had higher stressors on all domains than their Canadian counterparts (n=36). Their mean values were significantly lower (high mean score is more protective and lower mean score represents greater risk for increased stress) than the Canadian trainees (Table 3 and Figure 2). Amongst the EM specialists it was noted that the Canadian specialists (n=396) had higher control and demand stressors than their South African counterparts, whereas the South African specialists (n=36) had higher peer support and relationship stressors (Table 3 and Figure 2). Within the Canadian respondents cohort it was noted that Canadian specialists had significantly higher demand and manager support stressors than Canadian trainees. However, the trainees had higher role stressors than the specialists. For the South African respondents the South African specialists had lower stressors across all domains as compared to the South African trainees.

### **3.5 DISCUSSION**

Work related stressors are higher amongst South African EM trainees' across all six stressor domains as compared with their Canadian counterparts. This may be attributed to local resource limitations. For example, within the demands stressor, a work environment with less

access to equipment and disposable items, that is necessary to provide optimal patient care, may be a contributing factor. Furthermore, increased managerial and peer support stressors may be due to respective staff shortages not allowing for optimal shift rotational planning and cross-cover, thereby increasing duty hours and responsibility for the trainees resulting in higher stress. Olson (2009) reported that patient care may be compromised as long duty hours with associated sleep deprivation has a significant negative impact on cognitive impairment giving rise to the increased potential for medical error.(32) Resulting feelings of exhaustion, depression or irritability may further be detrimental to patient care. Nielsen (2013) concluded that with increasing work related stressors there was an associated occurrence of adverse events.(33)

Increased stress during the time of training may be an acceptable trade-off towards professional development. Ratanawongsa (2007) highlighted that residency/registrar-ship may be a time for temporary imbalance.(34) He acknowledges that resident well-being was closely connected to professional development and required varying degrees of self-sacrifice with a re-balancing of personal priorities.(34) However, it can be argued at what cost.

Possible trade-offs are the potential loss of excellent physicians from the specialty due to sustained occupational stressors and the detriment of optimum care for the health care user (patient). Indeed, Takayesu (2014) stated that burnout is highly prevalent amongst United States EM trainees with 65% of trainee respondents meeting acceptable burnout criteria.(35)

The Canadian trainees had the best outcome for peer support. This could be explained by a larger number of EM colleagues in training sharing the workload and more balanced duty hours. However, they also suffered from undue stress within the domains of: demands; role; manager support and control. Urgent interventions within these domains are required to help minimize the impact of these stressors.

Canadian EM specialists had higher demand and work control stressors in comparison to their South African counterparts. This may be explained by the fact that the EM specialty in Canada is more mature resulting in more rigidly defined work parameters. The specialists inherently have less say about the way work is conducted. It is striking to note though that the Canadian specialists had a lower mean score (higher stress) for the demands stressor as compared to the SA EM specialists. This is surprising considering that the specialty is less developed in South Africa where expectantly it would be assumed that greater work stressor demands would be placed on the South African EM specialist due to the high patient numbers and acuity they are exposed to.

The Canadian EM trainees had higher stressor scores for role and control stressors as compared with the Canadian EM specialists. This could potentially be attributed to the trainees still exploring and defining their role within the EM specialty. In terms of the control domain the trainees may feel like a “cog in the wheel” (akin to the South African EM trainees). The trainees may perceive that they are not consulted to provide input whenever changes are made to the system, this could be attributed to their junior status in the ranks of the specialising process. The Canadian specialists had higher stressor scores for demands; manager support; peer support and relationships. One of many possibilities is that the newly qualified specialist is expected to multi-task many different duties. This may range from clinical duties, managing the emergency department, supporting hospital management, contributing to academic teaching and performing research. Support and relationship stressors are high possibly due to liaison requirements of specialists between hospital management and staff as well playing an important role in conflict resolution amongst colleagues and patients alike. Furthermore, Kuhn (2009) and Dyrbye (2013) noted that occupational stressors and physician satisfaction does fluctuate over the course of a

physician's career, possibly explaining the variation in degree of measured stress during career progression.(36,37)

The measured scores for South African (SA) EM specialists in comparison with the SA EM trainees indicate lower stressors across all domains. This result may be expected; due to the SA specialists' decreased clinical duty hours during unsociable hours (on-call from home) and a greater understanding of playing an increased role in the development of EM within South Africa. This may contribute to a greater sense of control towards the EM organization and its future destiny. This latter factor may explain why the change and control stressors have better scores and are less severe than the other stressors.

### **3.5.1 Limitations:**

The cross-sectional study design does not measure the fact that occupational stress may vary over time. The low Canadian cohort response rate (39.8%) may have skewed the results due to responder bias. Although the number of South African respondents was low (n=89), their higher responder rate (60%) was more representative of the study population. The responder bias impact was limited by sending regular reminders to improve the responder rates in both surveys.

Non-responder bias may also have influenced the study results. Specialists and trainees in both countries feeling aggrieved due to severe stress were more likely to respond to the survey resulting in an over estimation of the measured stressors.

The South African responses were skewed towards Cape Town in comparison to the rest of the country especially noted in the trainee group. This may be attributed to the primary investigator working in the Western Cape Province training group.

Despite the study's internal limitations it was clear that occupational stress is pervasive across the organization of emergency medicine. The survey found that the South African EM

trainees were exposed to highest levels of work stressors across all measured stressor indicators. It is imperative that senior managers recognise this and act to reduce or mitigate affects these stressors. This should prevent the affects of continuous high stress such as burnout and possible attrition from the profession, which will be disastrous considering the shortage of EM physicians. Indeed it is argued that burnout is much less related to people than to the places they work in.(38) Hospital administrators need to be cognisant and be acutely aware of the causes, dangers and consequences of high levels of occupational stress in order to optimise work environments that create positive practice environments with positive outcomes for both health care worker and patient alike.

### **3.5.2 Conclusion**

The study concluded that occupational stressors were highest amongst EM trainees in South Africa followed by the South African EM specialists. The lower measured occupational stressors amongst Canadian EM respondents may be explained by the fact that the specialty is more established and less tenuous in its development than in South Africa.

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### 3.6 TABLES AND FIGURES

**3.6.1 Table 1: The UK HSE primary six work related risk factors (stressors)**

Key Work Stressors	MSIT questions pertaining to each stressor	Stressor Description
Demands	Q3, 6, 9, 12, 16, 18, 20 and 22	Which includes issues such as workload, work patterns and the working environment
Control	Q2, 10, 15, 19, 25 and 30	How much say the person has in the way they do their work
Support	Q7, 8, 23, 24, 27, 29, 31, 33 and 35	Which includes the encouragement and resources provided by the organization, line management and colleagues
Relationships at work	Q5, 14, 21 and 34	Which includes promoting positive working practices to avoid conflict and dealing with unacceptable behaviour
Role	Q1, 4, 11, 13 and 17	Whether people understand their role within the organization and whether the organization ensures that the person does not have conflicting roles
Change	Q26, 28 and 32	How organizational change is managed and communicated

(25,31)

**3.6.2 Table 2: Demographic data**

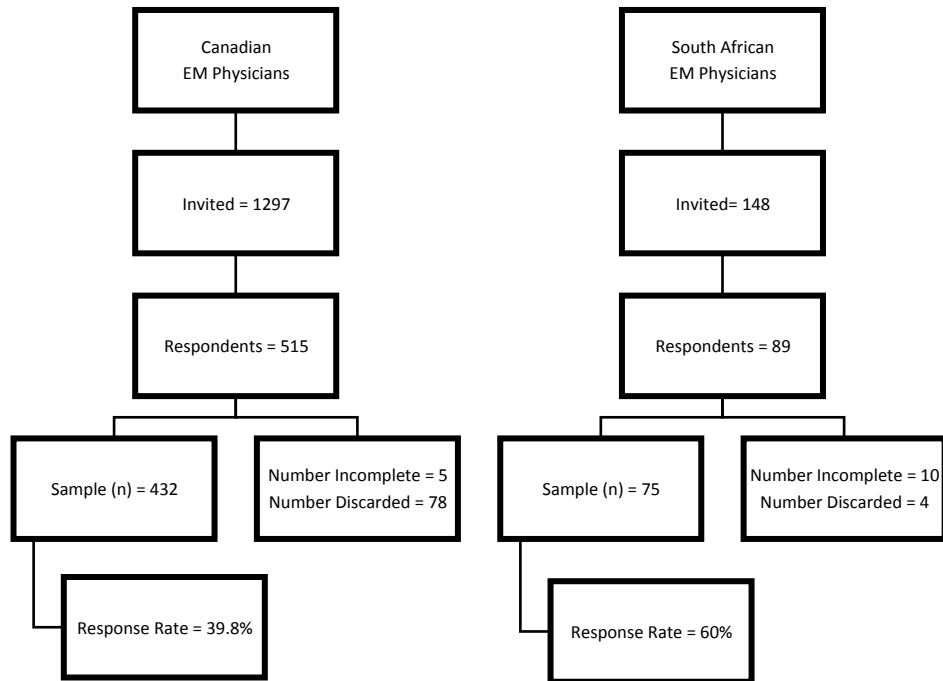
Demographic Data			South African		Canadian	
			Trainees	Specialists	Trainees	Specialists
<b>Sample (n= )</b>			39	36	36	396
Sex	Male		24	23	15	264
	Female		14	13	20	131
Age	18-24		0	0	0	0
	25-34		29	6	32	43
	35-44		9	24	3	149
	45-54		0	5	0	121
	55-64		0	1	0	67
	65-74		0	0	0	15
	≥75		0	0	0	0
Number of Years in EM Practice	<5		25	4	33	54
	5-10		12	17	0	1
	11-20		1	12	1	138
	21-30		0	3	1	157
	31-40		0	0	0	43
	>40		0	0	0	2
Do you expect to be working in EM in the next 5 years?	No		7 (18.4%)	3 (8.3%)	1 (2.9%)	66 (16.7%)
	If No then Why?	Age Related Retirement	0	0	0	41 (10.4%)
		Period of Training Requirement	2 (5.3%)	0	1 (2.9%)	0
		I don't see this as a long term career	5 (13.2%)	3 (8.3%)	0	24 (6.1%)

### 3.6.3 Table 3: MSIT Work Stressor Results for South African and Canadian EM Physicians and Trainee EM Physicians

(Lower values represent higher stressor levels for HSE risk factors)

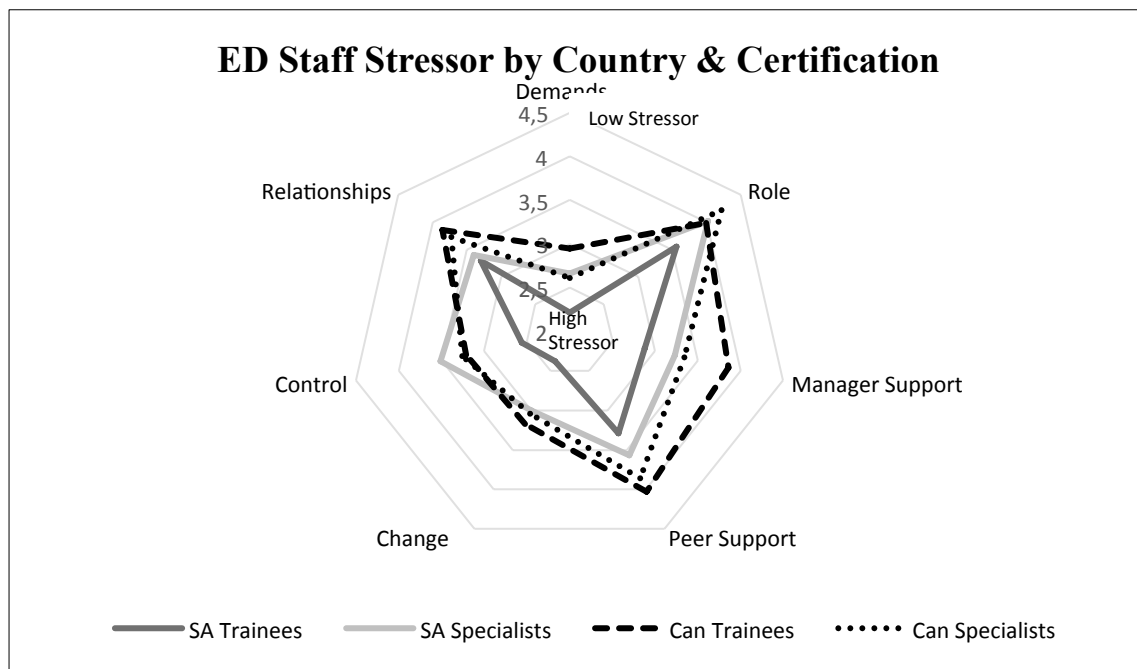
	SA EM Specialists (n=36)						
	Demands	Role	Manager Support	Peer Support	Change	Control	Relationships
Mean	2.66	4.02	3.23	3.57	3.00	3.51	3.40
SD	0.46	0.85	0.96	0.86	0.97	0.62	0.90
95% CI	2.50--2.80	3.73-4.30	2.91-3.56	3.28-3.86	2.67-3.33	3.30-3.72	3.09-3.70
	CAN EM Specialists (n=396)						
Mean	2.61	4.22	3.34	3.86	3.04	3.26	3.73
SD	0.58	0.52	0.74	0.54	0.84	0.69	0.62
95% CI	2.56-2.67	4.17-4.27	3.27-3.41	3.81-3.92	2.96-3.13	3.19-3.33	3.66-3.79
	CAN EM Trainees (n=36)						
Mean	2.95	3.99	3.86	4.03	3.17	3.21	3.86
SD	0.54	0.42	0.70	0.56	0.70	0.69	0.70
95% CI	2.77-3.14	3.85-4.14	3.63-4.10	3.85-4.22	2.93-3.40	2.98-3.45	3.63-4.10
	SA EM Trainees (n=39)						
Mean	2.22	3.56	2.88	3.29	2.38	2.56	3.30
SD	0.40	0.54	0.60	0.59	0.57	0.57	0.54
95% CI	2.09-2.35	3.38-3.74	2.68-3.07	3.10-3.49	2.19-2.56	2.38-2.75	3.13-3.48

### 3.6.4 Figure 1: South African and Canadian survey responses





**3.6.5 Figure 2: ED Staff Stressor by Country and Certification**  
 (Lower values = higher stressor)



## CHAPTER 4 CONCLUSIONS OF RESEARCH PROJECT

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Stress is ubiquitous within the specialty of emergency medicine and is often wrongly seen as a badge of honour in the Emergency Department.(1) By fully understanding the factors that contribute to our highly stressful work environment we can start to address and reduce them to optimise patient and health care professional outcomes alike.

CJ Mann, president of the college of emergency medicine of the UK, notes: “the importance of strategies to keep the EM workforce (healthy) and within the workplace cannot be overstated. Even against the backdrop of high workload and stress, emergency medicine still offers its practitioners the opportunity to positively influence patient care and outcomes across the spectrum of ages, disease and injury. On a daily basis, the potential to ‘make a difference’ and add ‘years to life and life to years’ is unparalleled; whether it is in the ‘life saved’ or the respectful and attentive stewardship of a patients’ final living moments.”(2) Emergency medicine needs to introduce sustainable and satisfying positive practice environments (PPE) that are vital to produce career longevity and to ensure the prevention of premature burnout. (2)

#### 4.1 REFERENCES

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## APPENDICES

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### APPENDIX 1: INVITATION TO PARTICIPATE

Dear Emergency Medicine colleague,

We would like to invite you to participate in our questionnaire. We are conducting a study to identify and assess work stressors of emergency medicine registrars/residents and specialists/consultants in two health systems (South Africa and Canada) and as such we are surveying Emergency Medicine (EM) trainees and specialists in both countries.

Emergency medicine doctors endure high levels of work stress which can lead to poor physical and mental health and may contribute to burnout and attrition from the profession. By identifying and assessing key work stressors of emergency medicine doctors, work can be done to modify and mitigate work stressors contributing to work stress. Hence, this should result in more positive practice environments and more positive outcomes for the patient and health care professional.

The survey is very short and should take about 4-7 minutes to answer. It is administered anonymously through an online survey platform.

The link to the survey is: <https://sunsurveys.sun.ac.za/WorkStressors.aspx>

Thank you for your consideration,

Dr. Sebastian de Haan

Emergency Medicine Registrar

Department of Emergency Medicine,

University of Stellenbosch,

Stellenbosch, South Africa

Email:

[dehaansebastian@gmail.com](mailto:dehaansebastian@gmail.com)

Email: [dehaansebastian@gmail.com](mailto:dehaansebastian@gmail.com)

Cell: 071 317 5009

## **APPENDIX 2: PARTICIPANT INFORMATION AND LETTER FOR INFORMED CONSENT**

### **Title of the Research Project:**

To identify and assess work stressors amongst emergency physicians in two health systems

### **Principal Investigator:**

Dr. Sebastian de Haan

### **Address:**

Emergency Medicine Registrar

Department of Emergency Medicine,

University of Stellenbosch,

Stellenbosch, South Africa

### **Email:**

[dehaansebastian@gmail.com](mailto:dehaansebastian@gmail.com)

You are being invited to take part in a research project. Please take some time to read the information presented here, which will explain the details of this project. It is very important that you are fully satisfied that you clearly understand what this research entails and how you could be involved. Your participation is entirely voluntary and you are free to decline to participate. If you say no, this will not affect you negatively in any way whatsoever. Even if you do agree to take part you are free to withdraw from this study at any point. However, it is inferred that, by participating in the survey you are providing consent to be part of the study.

Your autonomy and confidentiality will be maintained throughout all phases of the study. The study will be administered anonymously via an online survey in the form of a questionnaire on the Stellenbosch University online survey platform for all South African participants and on survey monkey for all Canadian participants. Data will be protected through encryption and will only be visible to the principal investigators, supervisors and biostatistician.

The study has been approved by both the Health Research Ethics Committee (HREC) at Stellenbosch University and the Research Ethics Board (REB) at Horizon Health Network. (see below). The study will be conducted according to ethical guidelines and principles of the International Declaration of Helsinki, South African Guidelines for Good Clinical Practice and the Medical Research Council

(MRC) Ethical Guidelines for Research. The Stellenbosch University HREC approval number is: **S14/07/146**. The Horizon Health Network REB approval reference number is: **2014-2033**.

There should be no adverse events or potential harm to you. You are free to follow-up with your supervisor or occupational health department if there are any concerns during or after the survey.

If you would like any further information please do not hesitate to contact myself or Dylan or you may contact the Stellenbosch University (SUN) Ethics Committee or the Horizon Health Network Research Ethics Board:

SUN Ethics Committee: Email: [ethics@sun.co.za](mailto:ethics@sun.co.za); Tel: [+27 \(0\)21 938 9677](tel:+27(0)219389677); Fax: [+27 \(0\)21 938 9855](tel:+27(0)219389855)

Horizon Health Network Regional Ethics Board: Email: [reboffice@HorizonNB.ca](mailto:reboffice@HorizonNB.ca);

Tel: +01 506 648 6094; Fax: +01 506 648 6173

Thank you for participating and helping to contribute towards developing a more positive practice environment for EM trainees and specialists and indirectly resulting in a more positive outcome for future patients.

Thank you and kind regards,

Dr. Sebastian de Haan

### **APPENDIX 3: HSE MANAGEMENT STANDARDS INDICATOR TOOL (QUESTIONNAIRE)**



### **HSE MANAGEMENT STANDARDS INDICATOR TOOL**

Instructions: It is recognised that working conditions affect worker well-being. Your responses to the questions below will help us determine our working conditions now, and enable us to monitor future improvements. In order for us to compare the current situation with past or future situations, it is important that your responses reflect your work in the last six months.

1	I am clear what is expected of me at work	Never <input type="checkbox"/> 1	Seldom <input type="checkbox"/> 2	Sometimes <input type="checkbox"/> 3	Often <input type="checkbox"/> 4	Always <input type="checkbox"/> 5
2	I can decide when to take a break	Never <input type="checkbox"/> 1	Seldom <input type="checkbox"/> 2	Sometimes <input type="checkbox"/> 3	Often <input type="checkbox"/> 4	Always <input type="checkbox"/> 5
3	Different groups at work demand things from me that are hard to combine	Never <input type="checkbox"/> 5	Seldom <input type="checkbox"/> 4	Sometimes <input type="checkbox"/> 3	Often <input type="checkbox"/> 2	Always <input type="checkbox"/> 1
4	I know how to go about getting my job done	Never <input type="checkbox"/> 1	Seldom <input type="checkbox"/> 2	Sometimes <input type="checkbox"/> 3	Often <input type="checkbox"/> 4	Always <input type="checkbox"/> 5
5	I am subject to personal harassment in the form of unkind words or behaviour	Never <input type="checkbox"/> 5	Seldom <input type="checkbox"/> 4	Sometimes <input type="checkbox"/> 3	Often <input type="checkbox"/> 2	Always <input type="checkbox"/> 1
6	I have unachievable deadlines	Never <input type="checkbox"/> 5	Seldom <input type="checkbox"/> 4	Sometimes <input type="checkbox"/> 3	Often <input type="checkbox"/> 2	Always <input type="checkbox"/> 1
7	If work gets difficult, my colleagues will help me	Never <input type="checkbox"/> 1	Seldom <input type="checkbox"/> 2	Sometimes <input type="checkbox"/> 3	Often <input type="checkbox"/> 4	Always <input type="checkbox"/> 5
8	I am given supportive feedback on the work I do	Never <input type="checkbox"/> 1	Seldom <input type="checkbox"/> 2	Sometimes <input type="checkbox"/> 3	Often <input type="checkbox"/> 4	Always <input type="checkbox"/> 5
9	I have to work very intensively	Never <input type="checkbox"/> 5	Seldom <input type="checkbox"/> 4	Sometimes <input type="checkbox"/> 3	Often <input type="checkbox"/> 2	Always <input type="checkbox"/> 1
10	I have a say in my own work speed	Never <input type="checkbox"/> 1	Seldom <input type="checkbox"/> 2	Sometimes <input type="checkbox"/> 3	Often <input type="checkbox"/> 4	Always <input type="checkbox"/> 5
11	I am clear what my duties and responsibilities are	Never <input type="checkbox"/> 1	Seldom <input type="checkbox"/> 2	Sometimes <input type="checkbox"/> 3	Often <input type="checkbox"/> 4	Always <input type="checkbox"/> 5
12	I have to neglect some tasks because I have too much to do	Never <input type="checkbox"/> 5	Seldom <input type="checkbox"/> 4	Sometimes <input type="checkbox"/> 3	Often <input type="checkbox"/> 2	Always <input type="checkbox"/> 1
13	I am clear about the goals and objectives for my department	Never <input type="checkbox"/> 1	Seldom <input type="checkbox"/> 2	Sometimes <input type="checkbox"/> 3	Often <input type="checkbox"/> 4	Always <input type="checkbox"/> 5
14	There is friction or anger between colleagues	Never <input type="checkbox"/> 5	Seldom <input type="checkbox"/> 4	Sometimes <input type="checkbox"/> 3	Often <input type="checkbox"/> 2	Always <input type="checkbox"/> 1
15	I have a choice in deciding how I do my work	Never <input type="checkbox"/> 1	Seldom <input type="checkbox"/> 2	Sometimes <input type="checkbox"/> 3	Often <input type="checkbox"/> 4	Always <input type="checkbox"/> 5
16	I am unable to take sufficient breaks	Never <input type="checkbox"/> 5	Seldom <input type="checkbox"/> 4	Sometimes <input type="checkbox"/> 3	Often <input type="checkbox"/> 2	Always <input type="checkbox"/> 1
17	I understand how my work fits into the overall aim of the organisation	Never <input type="checkbox"/> 1	Seldom <input type="checkbox"/> 2	Sometimes <input type="checkbox"/> 3	Often <input type="checkbox"/> 4	Always <input type="checkbox"/> 5
18	I am pressured to work long hours	Never <input type="checkbox"/> 5	Seldom <input type="checkbox"/> 4	Sometimes <input type="checkbox"/> 3	Often <input type="checkbox"/> 2	Always <input type="checkbox"/> 1
19	I have a choice in deciding what I do at work	Never <input type="checkbox"/> 1	Seldom <input type="checkbox"/> 2	Sometimes <input type="checkbox"/> 3	Often <input type="checkbox"/> 4	Always <input type="checkbox"/> 5



20	I have to work very fast	Never <input type="checkbox"/> 5	Seldom <input type="checkbox"/> 4	Sometimes <input type="checkbox"/> 3	Often <input type="checkbox"/> 2	Always <input type="checkbox"/> 1
21	I am subject to bullying at work	Never <input type="checkbox"/> 5	Seldom <input type="checkbox"/> 4	Sometimes <input type="checkbox"/> 3	Often <input type="checkbox"/> 2	Always <input type="checkbox"/> 1
22	I have unrealistic time pressures	Never <input type="checkbox"/> 5	Seldom <input type="checkbox"/> 4	Sometimes <input type="checkbox"/> 3	Often <input type="checkbox"/> 2	Always <input type="checkbox"/> 1
23	I can rely on my line manager to help me out with a work problem	Never <input type="checkbox"/> 1	Seldom <input type="checkbox"/> 2	Sometimes <input type="checkbox"/> 3	Often <input type="checkbox"/> 4	Always <input type="checkbox"/> 5
24	I get help and support I need from colleagues	Strongly disagree <input type="checkbox"/> 1	Disagree <input type="checkbox"/> 2	Neutral <input type="checkbox"/> 3	Agree <input type="checkbox"/> 4	Strongly agree <input type="checkbox"/> 5
25	I have some say over the way I work	Strongly disagree <input type="checkbox"/> 1	Disagree <input type="checkbox"/> 2	Neutral <input type="checkbox"/> 3	Agree <input type="checkbox"/> 4	Strongly agree <input type="checkbox"/> 5
26	I have sufficient opportunities to question managers about change at work	Strongly disagree <input type="checkbox"/> 1	Disagree <input type="checkbox"/> 2	Neutral <input type="checkbox"/> 3	Agree <input type="checkbox"/> 4	Strongly agree <input type="checkbox"/> 5
27	I receive the respect at work I deserve from my colleagues	Strongly disagree Disagree <input type="checkbox"/> 1	Neutral <input type="checkbox"/> 2	Agree <input type="checkbox"/> 3	<input type="checkbox"/> 4	Strongly agree <input type="checkbox"/> 5
28	Staff are always consulted about change at work	Strongly disagree Disagree <input type="checkbox"/> 1	Neutral <input type="checkbox"/> 2	Agree <input type="checkbox"/> 3	<input type="checkbox"/> 4	Strongly agree <input type="checkbox"/> 5
29	I can talk to my line manager about something that has upset or annoyed me about work	Strongly disagree <input type="checkbox"/> 1	Disagree <input type="checkbox"/> 2	Neutral <input type="checkbox"/> 3	Agree <input type="checkbox"/> 4	Strongly agree <input type="checkbox"/> 5
30	My working time can be flexible	Strongly disagree <input type="checkbox"/> 1	Disagree <input type="checkbox"/> 2	Neutral <input type="checkbox"/> 3	Agree <input type="checkbox"/> 4	Strongly agree <input type="checkbox"/> 5
31	My colleagues are willing to listen to my work-related problems	Strongly disagree <input type="checkbox"/> 1	Disagree <input type="checkbox"/> 2	Neutral <input type="checkbox"/> 3	Agree <input type="checkbox"/> 4	Strongly agree <input type="checkbox"/> 5
32	When changes are made at work, I am clear how they will work out in practice	Strongly disagree <input type="checkbox"/> 1	Disagree <input type="checkbox"/> 2	Neutral <input type="checkbox"/> 3	Agree <input type="checkbox"/> 4	Strongly agree <input type="checkbox"/> 5
33	I am supported through emotionally demanding work	Strongly disagree <input type="checkbox"/> 1	Disagree <input type="checkbox"/> 2	Neutral <input type="checkbox"/> 3	Agree <input type="checkbox"/> 4	Strongly agree <input type="checkbox"/> 5
34	Relationships at work are strained	Strongly disagree <input type="checkbox"/> 5	Disagree <input type="checkbox"/> 4	Neutral <input type="checkbox"/> 3	Agree <input type="checkbox"/> 2	Strongly agree <input type="checkbox"/> 1
35	My line manager encourages me at work	Strongly disagree <input type="checkbox"/> 1	Disagree <input type="checkbox"/> 2	Neutral <input type="checkbox"/> 3	Agree <input type="checkbox"/> 4	Strongly agree <input type="checkbox"/> 5

## **APPENDIX 4: LETTERS OF ACCEPTANCE (ETHICS APPROVAL)**

### **4.1 Stellenbosch University Health and Research Ethics Committee Approval:**



#### **Approved with Stipulations**

##### **New Application**

05-Aug-2014

De Haan, Sebastian S

**Ethics Reference #: S14/07/146**

**Title: To identify work stressors amongst emergency physicians in two health systems.**

Dear Sebastian De Haan,

The **New Application** received on **09-Jul-2014**, was reviewed by members of **Health Research Ethics Committee 2** via Expedited review procedures on **23-Jul-2014**.

Please note the following information about your approved research protocol:

Protocol Approval Period: **05-Aug-2014 -05-Aug-2015**

The Stipulations of your ethics approval are as follows:

#### **1. Informed Consent:**

- 1.1 Consider adding more paragraphs to facilitate reading.**
- 1.2 Please correct: Participant Information and Letter for inferred (informed?) consent**
- 1.3 Remove this from the informed Consent Form (ICF): " By instilling monitors in the work environment (to assess the modifications or limitations of the individual stressor), relevant stakeholders can carry out audits to assess how these changes have reduced work stress."**

Please remember to use your **protocol number (S14/07/146)** on any documents or correspondence with the HREC concerning your research protocol.

Please note that the HREC has the prerogative and authority to ask further questions, seek additional information, require further modifications, or monitor the conduct of your research and the consent process.

#### **After Ethical Review:**

Please note a template of the progress report is obtainable on [www.sun.ac.za/rds](http://www.sun.ac.za/rds) and should be submitted to the Committee before the year has expired. The Committee will then consider the continuation of the project for a further year (if necessary). Annually a number of projects may be selected randomly for an external audit.

Translation of the consent document to the language applicable to the study participants should be submitted.

Federal Wide Assurance Number: 00001372

Institutional Review Board (IRB) Number: IRB0005239

The Health Research Ethics Committee complies with the SA National Health Act No.61 2003 as it pertains to health research and the United States

Code of Federal Regulations Title 45 Part 46. This committee abides by the ethical norms and principles for research, established by the Declaration of Helsinki, the South African Medical Research Council Guidelines as well as the Guidelines for Ethical Research: Principles Structures and Processes 2004 (Department of Health).

#### **Provincial and City of Cape Town Approval**

Please note that for research at a primary or secondary healthcare facility permission must still be obtained from the relevant authorities (Western Cape Department of Health and/or City Health) to conduct the research as stated in the protocol. Contact persons are Ms Claudette Abrahams at Western Cape Department of Health ([healthres@pgwc.gov.za](mailto:healthres@pgwc.gov.za) Tel: +27 21 483 9907) and Dr Helene Visser at City Health ([Helene.Visser@capetown.gov.za](mailto:Helene.Visser@capetown.gov.za) Tel: +27 21 400 3981). Research that will be conducted at any tertiary academic institution requires approval from the relevant hospital manager. Ethics approval is required BEFORE approval can be obtained from these health authorities.

We wish you the best as you conduct your research.

For standard HREC forms and documents please visit: [www.sun.ac.za/rds](http://www.sun.ac.za/rds)

If you have any questions or need further assistance, please contact the HREC office at 0219389207.

**Included Documents:**

Invitation to participate

Protocol

Investigator CV (Lamprecht)

Protocol Synopsis

HREC general checklist

Consent form

Investigator declaration (de Haan)

Investigator CV (de Haan)

HREC New application form

Expedited review request

Investigator declaration (Lamprecht)

Sincerely,

Mertrude Davids

HREC Coordinator

Health Research Ethics Committee 2

## 4.2 Research Ethics Board of the Horizon Health Network Approval



### Research Ethics Board

Horizon Health Network, 5DN SJRH,  
400 University Avenue, Saint John, New Brunswick, Canada E2L 4L2  
Research Office - 506-648-6094 Tel 506-648-6173 Fax

August 27, 2014

Dr. Paul Atkinson  
Saint John Regional Hospital  
P.O. Box 2100  
Saint John, NB E2L 4L2

Dear Dr. Atkinson:

**Re: Work Stressors Affecting Emergency Physicians and Residents: A Survey**

**Protocol Number: 4**

**File #: 2014-2033**

This letter is being re-issued to correct the omission of the study questionnaire and inferred consent letter which were included as part of the study protocol. The original approval date will remain the same.

The above noted study has been reviewed and approved via the delegated review process. **Final Approval** is now granted by the Research Ethics Board. Re-approval should be initiated prior to August 5, 2015.

#### APPROVED:

- **Research Study Application:** signed and dated July 30, 2014
- **Protocol:** version 1.0 undated
- **HSE Management Standards Indicator Tool:** version undated
- **Participant Information and Letter for Inferred Consent:** version undated

#### Also on file:

- **Letter of Support Emergency Medicine:** signed and dated July 30, 2014
- **Curriculum Vitae Dr. Paul R. T. Atkinson**

The Research Ethics Board for the Horizon Health Network is organized and operates according to the principles of the ICH Harmonized Tripartite Guidelines: Good Clinical Practice, Tri-Council Policy Statement and Division 5 of the Food and Drug Regulations.

With kind regards,

Timothy Christie BA (hons). MA, MHSc, PhD  
Regional Director – Ethics Services  
Horizon Health Network REB  
TC/ty

#### **Research Ethics Board (REB)** (Address correspondence c/o Ethics Services)

##### Membership

Jeff Jennings  
*Chairperson/Methodological Expert*  
Eileen Malone  
*Vice Chair*  
Dr. Sohrab Lutchmedial  
*Interventional Cardiologist*  
Dr. Sanjay Siddhartha  
*Psychiatrist*  
Dr. Keith Wilson  
*Medical/ Family Medicine*  
Dr. Peter Martenyi  
*Medical/ Family Medicine*  
Dr. Glendon Sullivan  
*Medical*  
Dr. Hala Makary  
*Medical / Neonatologist*  
Dr. Amber Swan  
*Medical / Oncology*  
Diane Brideau-Laughlin  
*Pharmacist/Content Expert*  
Gisela Pisegna  
*Pharmacist/Content Expert*  
Mary Reeves  
*Content Expert*  
Jonathon Chase, Q.C.  
*Law*  
Mario DiCarlo  
*Law*  
Dr. Timothy Christie, MHSc, PhD  
*Ethics Expert*  
Dr. Marc Smith, PhD  
*Ethics Expert*  
Michael Coster  
*Non-Scientific*  
Marie-Nicole LeGresley  
*Non-Scientific*  
Dr. James Croll  
*Methodological Expert*  
Marlene Mercer  
*Nursing/Scientific*  
Gordon Friars  
*Community*  
David Hanson  
*Community*  
Al Kavanaugh  
*Community*  
Audrey Lampert  
*Community*  
J. Maurice Legere  
*Community*  
Lloyd Sutherland  
*Community*

## APPENDIX 5: INSTRUCTIONS FOR AUTHORS FOR CJEM (CANADIAN JOURNAL OF EMERGENCY MEDICINE)

### 5.1 OVERVIEW

The *Canadian Journal of Emergency Medicine (CJEM)* is a peer-reviewed journal that publishes articles of interest to Emergency Medicine care providers in rural, urban, community, and academic settings. *CJEM* focuses on emergency medicine content relevant to clinical practice, emergency medical services, research, medical education, administration, and continuing professional development and knowledge exchange. *CJEM* is indexed by the National Library of Medicine and is the official journal of the Canadian Association of Emergency Physicians (CAEP).

### 5.2 SCOPE AND CONTENT

We welcome submissions for any of the following categories. *CJEM* will make the final determination regarding category.

- Original Research o EM Advances o ED Administration o Pediatric EM o Toxicology o EMS o Community EM o Education
- State of the Art
- Brief Educational Reports
- Case Reports
- Knowledge Applied to Practice o *CJEM* Journal Club o Diagnostic Challenge o Tips from the Trenches o Images
- International EM
- Editorials/Commentaries
- Clinical Practice Guidelines
- Resident Issues
- Humanity

In addition, *CJEM* publishes letters to the editor and media reviews.

*CJEM* publishes articles in English or French; however, French language articles will be considered only if the bulk of the work was performed in Canada and the primary author is Canadian. Such submissions will be reviewed, edited, and published in French with an English abstract. Translation to French is provided for most editorials, abstracts of Original Research, issues of national significance, and CAEP position statements or guidelines.

*CJEM* provides high quality content in an easy-to-read format; brevity and use of the active voice are encouraged. Accepted articles will be edited for clarity, brevity, and style.

### 5.3 MANUSCRIPT PREPARATION

Authors should conform to the general guidelines laid out in “Uniform Requirements for Manuscripts Submitted to Biomedical Journals.”<sup>1</sup> *CJEM* uses the *Canadian Oxford Dictionary* (2<sup>nd</sup> ed.) for spelling; *The Chicago Manual of Style* (16<sup>th</sup> ed.) for grammar, style, and punctuation; and *Dorland’s Illustrated Medical Dictionary* (32<sup>nd</sup> ed.) for spelling of medical terms.

### 5.4 FORMATTING

Manuscripts should be double-spaced throughout. Authors should use a consistent 12point font, preferably Times New Roman. Right margins should be unjustified (ragged). **Do not** include any special formats including small caps, paragraph adjustment, page numbering, running header, or embedded citations, all of which make the editorial process more difficult.

Manuscripts must include the following:

**Title page:** The title page should include the article title, the authors’ name(s) as they should appear in print, and the affiliations and degrees of all authors. The name, address, telephone number, fax number, and e-mail address for the corresponding author should be provided. The title page must also include a word count and running header of no more than 150 characters. All papers must include an explicit statement on the title page declaring whether or not the authors have any financial or other conflicts of interest related to the submission (see Conflict of Interest below).

**Abstracts:** Structured abstracts (Objectives, Methods, Results, Conclusions) of up to 250 words are required for Original Research articles. Structured abstracts of up to 250 words are also required for State of the Art systematic reviews (Objectives, Data Source, Study Selection, Data Extraction, Data Synthesis, Conclusions). Case Reports should include an unstructured abstract of up to 200 words that summarizes the main points of the case. Abstracts are not required for other submissions including Editorials/Commentaries, Knowledge Applied to Practice, Resident Issues, or Humanity articles. For papers written in English, the abstracts will be translated into French by the editorial office and *vice versa*.

**Laboratory Results:** All results should be reported using SI units, including molar rather than mass-based units for concentration in most cases.

**References:** References should be formatted based on the examples provided at the end of these “Instructions for Authors.” Within the text, references should be numbered in the order they appear

using standard text and angular brackets (e.g., <1>) rather than using superscript numbers. DO NOT LEAVE ANY special word-processing software formatting commands for sections or references embedded in the documents being submitted. References should cite surname and initials for up to three authors. Fourth and subsequent authors should be cited as “*et al.*”

*A manuscript not meeting these requirements will be returned without review.*

## 5.5 MANUSCRIPT SUBMISSION

All manuscripts (including tables and figures) must be submitted electronically via Manuscript Central’s ScholarOne tracking system at <http://mc.manuscriptcentral.com/cjem>

**Cover Letter:** All submissions should be accompanied by a brief cover letter. Within the cover letter, the corresponding author should disclose potential conflicts of interest and financial support, specify each author’s contribution to the work, and indicate that all co-authors have had the opportunity to review the final manuscript and have provided their permission to publish the manuscript.

**Tables:** Tables must be prepared in MS Word or equivalent using the Table feature, and be part of the main manuscript document. Tables cannot be used if they are in PowerPoint or Excel, or if they are supplied as images. Each table should appear on a separate page at the end of the article after the references. Each table should have a title and be numbered in order of callout within the text. Excessive use of horizontal lines and all shading should be avoided. Non-standard abbreviations and units of measure should appear in the table or legend.

**Figures:** Each individual figure should be uploaded as a separate digital file. Figures must be clearly numbered in order of callout, and file names must match the figure numbers in the text. Photographs should be saved as TIF files, 300 dpi, and five inches in width. Black and white photographs should be saved in greyscale and colour photographs should be saved in CMYK. Line drawings should be saved as TIF, JPG, or EPS files, 600 dpi, and five inches in width. Black and white line drawings should be saved in greyscale and colour line drawings should be saved in CMYK. Authors who wish to publish a figure in colour in the printed edition will be responsible for the cost of doing so. However, colour figures will be put online in colour at no additional charge. Avoid unnecessary embellishments (e.g. 3-D bars for data with only two dimensions, internal gridlines, pie charts), but consider using the potential richness of a visual representation of the data to its fullest (e.g. scattergrams or boxplots rather than simple histograms, survival curves for time-to-event data). Flow charts must not exceed seven inches in width. A legend must be supplied for each figure including a descriptive title and sufficient information to render the figure to be self-explanatory. The figure



legend(s) should appear in the main manuscript document, on a separate page after the Tables and in order of callout.

If figures, tables, illustrations, or other material have been taken or adapted from a previous publication, the authors are responsible for obtaining written permission from the copyright holder to reproduce these items and providing said written permission to *CJEM* at the time of submission. If patients could possibly be identified by photographs or descriptions within the manuscript, authors are responsible for obtaining written consent from the patients to publish their photographs or descriptions. Further questions or comments regarding manuscript submission can be sent to [cjem@rogers.com](mailto:cjem@rogers.com)

## 5.6 PREVIOUS PUBLICATION

In accordance with “Uniform Requirements,”<sup>1</sup> manuscripts will be considered only if they have not been previously published nor are they under consideration by another journal. Authors are referred to “Uniform Requirements” for detailed guidelines on previous publication and exceptions.

## 5.7 REVIEW AND EDITORIAL PROCESSES

All submissions are initially reviewed by the Editor-in-Chief or one of the Senior Associate Editors. Articles judged unsuitable for *CJEM* will be returned to the authors following this step, typically within two weeks. Those meeting screening criteria will be forwarded for blinded peer review, with the exception of Letters to the Editor and Images. Peer review comments will be forwarded to a Decision Editor, who will decide whether the article should be categorized as “Accept,” “Revise and Accept,” “Revise and Resubmit,” or “Reject.” The Decision Editor will compose a response letter to the author. In most cases, authors can expect a decision within 8 weeks of original manuscript submission.

To revise your manuscript, log into <http://mc.manuscriptcentral.com/cjem> and enter your Author Centre, where you will find your manuscript title listed under “Manuscripts with Decisions.” Under “Actions,” click on “Create a Revision.” Your manuscript number will be appended to denote a revision. You will be unable to make your revisions on the originally submitted version of the manuscript. Instead, revise your manuscript using a word processing program and save it on your computer. Please also highlight the changes to your manuscript within the document, ideally by using the track changes mode in MS Word or by using bold or coloured text. Once the revised manuscript is prepared, you can upload it and submit it through your Author Centre.

When submitting your revised manuscript, you will be able to respond to the comments made by the reviewer(s) in the space provided. In this space, please address each of the suggestions and cite where in the manuscript the change has been made. If no change was made, please explain why. In order to expedite the processing of the revised manuscript, please be as specific as possible in your response to the reviewer(s).

All revisions will be reviewed by the Decision Editor, who may consult with the original or new peer reviewers, to determine whether review comments have been addressed. The Decision Editor, along with the Editor-in-Chief or a Senior Associate Editor, will make a final decision regarding publication. Accepted articles will be edited, and authors will have the opportunity to review and approve revisions prior to publication. Manuscripts submitted to *CJEM* will be treated with respect and confidentiality.

Published manuscripts become the property of CAEP and may not be published elsewhere without permission.

## **5.8 CONFLICT OF INTEREST**

All authors are required to sign a conflict of interest disclosure form indicating any financial interests or other potential conflicts of interest they have relating to the manuscript. Such conflicts might arise from personal relationships or from institutional relationships. *CJEM* has adopted the International Committee of Medical Journal Editors policy on disclosure of conflicts, including the glossary which provides a definition of conflict of interest and other terms surrounding potential conflicts (available at [http://www.icmje.org/coi\\_glossary.html](http://www.icmje.org/coi_glossary.html)). Each author of a work must complete and submit a conflict of interest form found at [http://www.icmje.org/coi\\_disclosure.pdf](http://www.icmje.org/coi_disclosure.pdf). If the corresponding author declares on behalf of all the other authors that no conflicts exist, then a single form to that effect from the corresponding author will suffice. Completed conflict of interest declarations should be uploaded at the time of manuscript submission. If sent by mail or e-mail to the journal, they must be received before a decision (other than rejection) can be rendered.

## **5.9 MANUSCRIPT CATEGORIES**

### **5.9.1 Original Research**

(2000–3000 words excluding abstract, tables, figures, and references)

These articles present primary data arising from original research. Effective September 2007, all clinical trial reports submitted to *CJEM* must be registered with an accepted clinical trials registry, such as ClinicalTrials.gov<sup>2</sup> or the International Committee of Medical Journal Editors (ICMJE)<sup>1</sup>, and the registration number should be included in the manuscript. Researchers initiating studies should

register as soon as Ethics Board approval has been obtained. Although *CJEM* encourages researchers to use ClinicalTrials.gov as their registry site<sup>2</sup>, any recognized international registry will be accepted. Discussion about the role of trials registries can be found in an editorial by Laine et al.<sup>3</sup>

Authors of randomized clinical trials should conform to the criteria specified in the CONSORT statement.<sup>4</sup> Cardiac arrest studies should follow the Utstein criteria when appropriate.<sup>5</sup>

Authors of retrospective medical record reviews should, where appropriate, incorporate the design elements discussed by Gilbert et al.<sup>6</sup> *CJEM* has established minimal criteria for publication of medical record reviews based on these criteria. Authors reporting the performance of a diagnostic test should follow the STARD initiative.<sup>7</sup>

- A structured Abstract must be included (see above).
- The Introduction should succinctly discuss study background, importance and the *a priori* study question, objectives or hypothesis.
- The Methods section should include a description of the overall study design as planned, the study setting, time period, population studied (with eligibility criteria and unit of analysis if different from individual patients), a description of the intervention, the primary and secondary outcome measures, and the statistical analysis employed. For investigations involving human subjects, the nature and timing of the consent that was obtained must be specified. There should be sufficient detail to allow a knowledgeable reader to replicate the study, at least in theory. Authors must explicitly name the ethics committee or investigational review board which approved the research.
- The Results section should present primary and secondary results, without undue repetition of data reported in tables and figures. Any substantial deviations from the study as planned usually appear in this section. Measurements and rates should be reported using the appropriate number of significant digits, based on the precision of the measure (e.g. “After providing informed consent, 11 (13%) of 82 subjects withdrew from the study before being administered the intervention.” rather than “(13.4%)”).
- The Discussion section should highlight the important study findings and their implications especially in the context of previous work, but without exhaustively summarizing the prior literature. In addition, the Discussion should identify limitations of the research and how any biases may affect the interpretation of the findings.
- Conclusions should be stated in one paragraph and must be supported by the study findings. Avoid extending your conclusion beyond what your data show.
- Most papers will benefit from at least one and not more than five tables or figures.

### 5.9.2 State of the Art

(3000–4000 words excluding abstract, tables, figures, and references)

This section is devoted to quantitative or qualitative systematic reviews of the scientific literature. Narrative or non-systematic reviews will not be considered for publication. All articles or data sources should be selected systematically for inclusion and critically evaluated, and the selection process should be described in the paper. Authors of systematic reviews should refer to the PRISMA statement whether or not they incorporate a meta-analysis in the review.<sup>8</sup> Authors of systematic reviews are encouraged to follow the 27-item PRISMA checklist (available at [prisma-statement.org](http://prisma-statement.org)), and to provide a flow diagram describing the selection of studies.

### 5.9.3 Brief Educational Reports

(1000 words or less with one figure or table and no more than 10 references)

For this section, *CJEM* will consider original scholarly submissions that are not original research but do discuss educational advances in emergency medicine. Authors should define how the submission is innovative, builds on existing literature and adds to the scholarship of education. Submissions should be structured as follows: Background, Purpose or Rationale, Description of the Innovation, Discussion, and Summary.

Sufficient detail allowing readers to reproduce the innovation is required. If necessary, forms or other tools required to set up the innovation may be accepted for on-line publication. A unstructured abstract of less than 200 words is also required.

### 5.9.4 Case Reports

(1000–2000 words excluding abstract, tables, figures, and references)

Case Reports will only be considered if they:

- identify a previously undescribed finding or phenomenon
- describe a therapy that could lead to future research or a change in practice All cases for consideration should have a “take home” clinical message pertinent to Canadian Emergency Physicians.

Authors should conform to the general guidelines laid out in “Uniform Requirements.”<sup>1</sup> Manuscripts submitted to “Case Reports” should include:

- an Abstract
- a brief Introduction (one or two paragraphs describing why the topic is important)
- the Case Report consisting of a succinct summary of relevant historical, physical, laboratory, and imaging findings; emergency department diagnosis, management, and disposition; and relevant follow-up information (e.g. patient outcome, findings at necropsy, confirmatory testing for agent reportedly ingested)

- a Discussion summarizing the salient teaching points
- a brief Conclusion

## 5.10 KNOWLEDGE APPLIED TO PRACTICE

### 5.10.1 CJEM Journal Club

(600-1200 words excluding tables, figures, and references)

“*CJEM* Journal Club” is devoted to evidence-based article reviews. The aims of this section are to demonstrate the use of the critical review format, to review articles of interest to emergency physicians, and to determine the relative validity and usefulness of these articles. To assist readers in keeping abreast of the relevant EM literature, timely reviews of important articles/topics will be a factor in the decision to accept. Review articles must address three key questions:

- What are the results?
- Are the results valid?
- Will the results help me care for my patients?

The preferred review methodology, including critical review forms, is described in “Users Guide to the Medical Literature,” a series published in the *Journal of the American Medical Association*.<sup>9</sup> Authors wishing specific guidance should consider making use of the critical appraisal tools found at the Centre for Evidence-Based Medicine [www.cebm.net](http://www.cebm.net),<sup>10</sup> or peruse articles published in *ACP Journal*.<sup>11</sup>

### 5.10.2 Diagnostic Challenge:

(500–1000 words excluding tables, figures, and references)

Authors may submit brief case summaries accompanied by one or two images that will stimulate diagnostic deliberation by the reader and form a foundation for discussion. Diagnosis and explanation should be distinct from the case presentation.

### 5.10.3 Tips from the Trenches:

(1000–1500 words excluding tables, figures, and references)

The purpose of this section is to publish very brief reports of clinical techniques or “pearls.”

### 5.10.4 Images:

(250 words or less excluding references)

This section should include interesting, high-quality clinical images with accompanying text that briefly reviews the important features of the related case.

## 5.11 INTERNATIONAL EM

(1000–1500 words excluding tables, figures, and references)

This is a forum for descriptive articles on emergency medicine experiences in countries other than Canada. Articles should contain elements of human interest or of disease or practice patterns that are unique or unusual and of interest to Canadian emergency physicians. Accompanying visual images are strongly encouraged.

### **5.12 EDITORIALS/COMMENTARIES**

(1000–1500 words excluding references)

Although normally by invitation, authors may submit a focused discussion on major current problems of emergency physicians or on controversial matters with significant implications for emergency medicine. Commentaries may also be sought to accompany an original research article in a given issue, generally by invitation of the editors.

### **5.13 CLINICAL PRACTICE GUIDELINES**

Authors planning to submit clinical practice guidelines should communicate directly with the Editor-in-Chief, and will be expected to follow CJEM's clinical practice guidelines. In order to be considered for publication, guidelines should be endorsed by a national organization and may be abridged or edited due to space constraints.

### **5.14 RESIDENT ISSUES**

(750–1000 words excluding references)

### **5.15 HUMANITY**

(1000 words or less excluding references)

Submissions should reflect the challenges of working in medicine. Generally they should be humorous or provide some human interest and add to our understanding of the physician experience, particularly in Canada.

### **5.16 LETTERS**

(Letters will be limited to 400 words and five references)

Letters should be addressed to the Editor, and should be submitted electronically via Manuscript Central's Scholar One tracking system at: <http://mc.manuscriptcentral.com/cjem>. Letters will be considered for publication if they relate to topics of interest to emergency physicians in urban, rural, community, or academic settings, or if they are in response to (and relevant to) a recent *CJEM* publication. Letters are generally not peer reviewed but may be edited for brevity and clarity. Letters responding to a previously published *CJEM* article should be submitted within eight weeks of the article's publication. Authors whose work is discussed will typically be given an opportunity to respond.

## 5.17 CONTACTING *CJEM* EDITORS

Authors with questions regarding a submission or prospective authors who wish to discuss a paper in the development stage are encouraged to contact the Editor-in-Chief or the appropriate Section Editor by e-mail at [cjem@rogers.com](mailto:cjem@rogers.com).

Further information can be obtained from the Editor-in-Chief or the Managing Editor at [cjem@rogers.com](mailto:cjem@rogers.com).

## 5.18 ADDITIONAL RESOURCES

Authors are encouraged to submit articles in many areas of research. Common methodological guidelines for reporting different types of studies have been summarized below. Authors should generally follow these reporting guidelines for a given study design, in an effort to improve the overall quality of the medical literature. Please be advised that this list should not be considered comprehensive for all possible study designs.

STUDY DESIGN	REPORTING GUIDELINE
Randomized Controlled Trial - Superiority design	CONSORT Statement <sup>12</sup>
Randomized Controlled Trial - NonInferiority/Equivalence design	Modified CONSORT Statement <sup>13</sup>
Systematic Review	PRISMA Statement <sup>8</sup>
Diagnostic Test Performance Study	STARD Statement <sup>7</sup>
Systematic Review of Diagnostic Tests	QUADAS Statement <sup>14</sup>
Meta-analysis of Observational Studies	MOOSE Statement <sup>15</sup>
Economic Evaluations	CHEC Criteria <sup>16</sup>

## 5.19 REFERENCES

1. International Committee of Medical Journal Editors. Uniform requirements for manuscripts submitted to biomedical journals. Available at: [http://www.icmje.org/urm\\_main.html](http://www.icmje.org/urm_main.html) (accessed December 20, 2011).
2. The US National Institutes of Health. ClinicalTrials.gov. Available at: <http://clinicaltrials.gov> (accessed July 2012).
3. Laine C, Horton R, DeAngelis CD, et al. Clinical trial registration: looking back and moving ahead. *CMAJ* 2007;177(1):57-8, doi: 10.1503/cmaj.070753.
4. The CONSORT Group. The CONSORT statement. Available at: <http://www.consortstatement.org/> (accessed December 20, 2011).
5. Cummins RO, Chamberlain DA, Abramson NS, et al. Recommended guidelines for uniform reporting of data from out-of-hospital cardiac arrest: the Utstein Style. Task Force of the American Heart Association, the European Resuscitation Council, the Heart and Stroke Foundation of Canada, and the Australian Resuscitation Council. *Ann Emerg Med* 1991;20(8):861-74.
6. Gilbert EH, Lowenstein SR, Koziol-McLain J, et al. Chart reviews in emergency medicine research: Where are the methods? *Ann Emerg Med* 1996;27(3):305-8.
7. Bossuyt PM, Reitsma JB, Bruns DE, et al. Towards complete and accurate reporting of studies of diagnostic accuracy: the STARD initiative. *Clin Chem* 2003;49:1-6. Available at: <http://www.stard-statement.org/>
8. Moher D, Liberati A, Tetzlaff J, et al., The PRISMA Group (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA Statement. *Open Med* 2009;3(3):123-30. <http://www.prisma-statement.org/>
9. Hunt DL, McKibbin KA. Locating and appraising systematic reviews. *Ann Intern Med* 1997;126(7):532-8.
10. Higgins JPT, Green S, editors. Systematic reviews seek to collate all evidence that fits pre-specified eligibility criteria in order to address a specific research question. They aim to minimize



bias by using explicit, systematic methods." *Cochrane Handbook for Systematic Reviews of Interventions* Version 5.1.0 [updated March 2011]. The Cochrane Collaboration, 2011. Available at: <http://www.cochrane-handbook.org/>

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